

WHAT IS CLAIMED IS:

1. An elongated bumper core of a polyolefin-based resin-containing foam having a density of  $0.045-0.2 \text{ g/cm}^3$  and showing a compressive load of  $F_{20}$  at 20 % strain, a compressive load of  $F_{40}$  at 40 % strain and a compressive load of  $F_{60}$  at 60 % strain when compressed by a rigid pipe having an outer diameter of 70 mm at a compression speed of 500 mm/minute, wherein the ratio  $F_{20}/F_{40}$  is in the range of 0.6-1.3 and the ratio  $F_{60}/F_{40}$  is in the range of 0.75-1.3.
2. A bumper core as claimed in claim 1, wherein the compressive load  $F_{40}$  is in the range of 1-6 kN.
3. A bumper core as claimed in claim 1, having a true volume  $V_T \text{ cm}^3$ , and including one or more weight reducing portions having a total volume of  $V_V \text{ cm}^3$ , wherein  $V_T$  and  $V_V$  satisfy the following condition:  
$$0.2 \leq V_T / (V_T + V_V) \leq 0.7.$$
4. A bumper core as claimed in claim 1, including a front section extending lengthwise of said bumper core, and at least two, longitudinally extending, vertically spaced apart protrusions each extending rearwardly from said front section, wherein each of said protrusions has a thickness in the vertical direction of  $T \text{ mm}$  and a length in the front to rear direction of  $H \text{ mm}$ , wherein the ratio of  $H/T$  is 2 to 10, and wherein the polyolefin-based resin-containing foam from which said protrusions are formed has a bending load of 35-400 N.
5. A bumper core as claimed in claim 1, including at least two, vertically spaced apart U-shaped sections each formed by a vertical front wall extending lengthwise of

said bumper core and at least two legs extending longitudinally and also rearwardly from said vertical front wall to define between adjacent two legs a space which is open rearwardly; and an interconnecting section  
5 connecting adjacent two legs of each of the two adjacent U-shaped sections at a position spaced apart rearwardly from at least one of said front walls of said adjacent two U-shaped sections so that the U-shaped sections are interconnected together into a unitary structure.

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6. A bumper core as claimed in claim 5, having a foremost plane in which at least one of said front walls of said U-shaped sections is located and a rearmost plane in which a rear end of at least one of said legs of said  
15 U-shaped sections is located, and wherein said interconnecting section is located at a position spaced apart from said foremost plane a distance equal to at least one thirds of the distance between said foremost plane and said rearmost plane.

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7. A bumper core as claimed in claim 6, wherein said interconnecting section is located at said rearmost plane.

8. A bumper core as claimed in claim 5, wherein said  
25 interconnecting section extends vertically and longitudinally.

9. A bumper core as claimed in claim 5, wherein each of said legs has a thickness in the vertical direction of T mm and a length in the front to rear direction of H mm,  
30 and wherein the ratio of H/T is 2 to 10.

10. A bumper core as claimed in claim 1, wherein said polyolefin-based resin is a polypropylene-based resin.

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11. A bumper core as claimed in claim 10, wherein said polypropylene-based resin has a tensile modulus of at least 1,200 MPa.

5 12. A bumper core as claimed in claim 10, obtained by molding expanded beads of the polypropylene-based resin in a mold.

10 13. An elongated bumper core of a polyolefin-based resin-containing foam having a density of 0.045-0.2 g/cm<sup>3</sup>, comprising a front section extending lengthwise of said bumper core, and at least two, longitudinally extending, vertically spaced apart protrusions each extending rearwardly from said front section, wherein each of said  
15 protrusions has a thickness in the vertical direction of T mm and a length in the front to rear direction of H mm, wherein the ratio of H/T is 2 to 10, wherein the polyolefin-based resin-containing foam from which said protrusions are formed has a bending load of 35-400 N,  
20 said bumper core having a true volume VT cm<sup>3</sup> and including one or more weight reducing portions having a total volume of VV cm<sup>3</sup>, wherein VT and VV satisfy the following condition:

$$0.2 \leq VT / (VT + VV) \leq 0.7.$$

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14. A bumper core as claimed in claim 13, further comprising at least one interconnecting section connecting adjacent two legs at a position spaced apart rearwardly from said front section, and at least one aperture formed  
30 in said front section.

15. An elongated bumper core of a polyolefin-based resin-containing foam having a density of 0.045-0.2 g/cm<sup>3</sup>, comprising at least two, vertically spaced apart U-shaped  
35 sections each formed by a vertical front wall extending

lengthwise of said bumper core and at least two legs  
extending longitudinally and also rearwardly from said  
vertical front wall to define between adjacent two legs a  
space which is open rearwardly; and an interconnecting  
5 section connecting adjacent two legs of each of the two  
adjacent U-shaped sections at a position spaced apart  
rearwardly from at least one of said front walls of said  
adjacent two U-shaped sections so that the U-shaped  
sections are interconnected together into a unitary  
10 structure.

16. A bumper for attachment to a front of a vehicle,  
comprising a bumper fascia, a bumper core according to  
claim 1 having a front side attached to said bumper fascia,  
15 and a reinforcement to which a rear side of the bumper  
core is attached.

17. A bumper for attachment to a front of a vehicle,  
comprising a bumper fascia, a bumper core according to  
20 claim 13 having a front side attached to said bumper  
fascia, and a reinforcement to which a rear side of the  
bumper core is attached.

18. A bumper for attachment to a front of a vehicle,  
25 comprising a bumper fascia, a bumper core according to  
claim 15 having a front side attached to said bumper  
fascia, and a reinforcement to which a rear side of the  
bumper core is attached.

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